GP 303377

FUEL REFORMING INLET DEVICE, SYSTEM AND PROCESS

ABSTRACT OF THE DISCLOSURE

A fuel reforming system includes an inlet device for a reactor having a housing defining a frustoconical interior region having an inlet opening and an outlet opening. A tube mixer having a helical divider may be optionally employed to transfer fluid into the inlet opening. A retention member is placed at each of the openings and a plurality of particles is contained within the frustoconical interior region between the retention members. An insulator placed between the outlet opening and the catalyst reaction surface minimizes temperature non-uniformities over the catalyst surface area, which preserves the catalyst contained within the reaction surface and prevents premature onset of the reaction prior to contact of a reactant mixture with the reaction surface. As a reactant fluid material passes through the inlet device it forms a homogenous reactant fluid material which then flows onto a catalytic reaction surface to form a reformate. Even distribution of the reactant fluid material onto the catalyst reaction surface provides uniform reactivity of the various components (e.g. fuel, air and exhaust gas mixture) comprising the reactant mixture, which helps reduce carbon build-up in the system and increases thermal efficiency.